Space Weather Forecast

Issued on Tuesday, 01 March 2022 at 12:41 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of G1 Minor Geomagnetic Storms to end current working week. Probable increasing Slight Chance of R1 Minor Radio Blackouts.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was very low in the last 24 hours, with no notable X-ray flares recorded. There are currently five sunspot regions on the facing side of the sun. Those in the western solar hemisphere are mature, stable and magnetically unipolar (all traits that tend towards a reduced risk of flares). The eastern solar hemisphere was the preserve of three minor and diffuse magnetically bipolar groups, albeit still with no noteworthy activity.

Some peripheral Coronal Mass Ejections (CMEs) were visible in satellite imagery in the period, with no suggestions of Earth-bound components from analysis. A possible 'filament lift off' (arc of plasma ejected from the sun) from both the central northern hemisphere and also the southwest of the sun do not appear to have Earth-directed components.

Solar Wind / Geomagnetic Activity: Earth is currently in an elevated positive polarity fast solar wind. The solar wind speed fluctuated slightly around elevated levels, although the number of particles and their associated magnetic field were within normal background. The net result of these solar wind measures was provisionally quiet geomagnetic activity throughout.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is forecast to be low, with isolated common-class flares likely, while there is a daily slight chance of moderate-class flares. This may increase slightly in the coming days given large returning sunspot regions over the sun's eastern horizon from midweek.

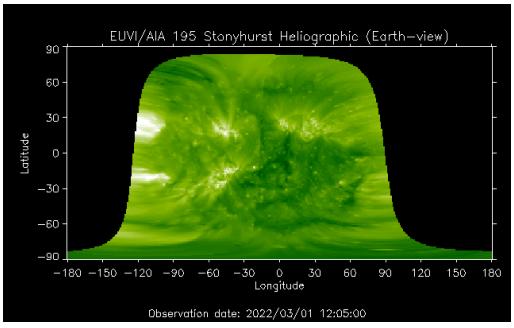

Figure 1: Cylindrical projection of whole sun in false colour extreme UV, showing forthcoming bright regions (likely corresponding to sunspots) narrowly over the the sun's eastern horizon (between 120E and 90E).

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Met Office Space Weather Forecast

Solar Wind / Geomagnetic Activity: No Earth-directed CMEs currently feature in the forecast. A series of fast wind high speed streams should feature in this period, mostly not impactful, with the possible exception of a larger 'coronal hole' fast wind due on day four (Friday 04 March), giving the greatest chance of Minor Geomagnetic Storm G1.

Energetic Particles / Solar Radiation: No solar radiation storms are expected.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	1	1	40
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	5	5	5	5
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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